

Remarks

Reconsideration of this Application is respectfully requested.

Claims 3, 4, 6, 7, 9, 10, 12, 13, 16, 17, 18, 20-32, 35-65 and 67-70 are pending in the application, with 6, 13, 18, 38, and 60 being the independent claims. Claims 1, 2, 5, 8, 11, 14, 15, 19, 33, 34, and 66 were previously canceled. Claims 3, 4, 6, 7, 9, 10, 12, 18, 20-32, and 35-51, 60-65, 67, and 68 were previously withdrawn. Claims 69 and 70 are sought to be added. No new matter has been introduced.

Based on the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections under 35 U.S.C. § 103

In paragraph 3 of the Office Action, claims 13, 16, 17, 52-59, and 70 were rejected as being unpatentable over U.S. Patent No. 5,744,863 to Culnane et al. (hereinafter Culnane) in view of U.S. Patent No. 6,545,351 to Jamieson et al. (hereinafter Jamieson). Applicants respectfully traverse this rejection.

Independent claim 13 recites:

A ball grid array (BGA) package, comprising:

 a substrate having a plurality of contact pads on a first surface electrically connected through said substrate to a plurality of solder ball pads on a second surface of said substrate;

 an integrated circuit (IC) die that is mounted to said first surface of said substrate;

 a heat spreader that has a first surface and a second surface, wherein said first surface of said heat spreader is attached to said second surface of said substrate; and

 a ring shaped stiffener being centrally open in a first surface and a second surface, wherein said first surface of said ring shaped stiffener is attached to said first surface of said substrate;

 wherein said second surface of said heat spreader is capable of being coupled to a printed circuit board (PCB);

wherein said IC die is mounted to said first surface of said substrate in a flip chip configuration, wherein a conductive bump on an active surface of said IC die is connected to a conductive pad on said first surface of said substrate.

Applicants assert that a *prima facie* case of obviousness has not been established in the Office Action for at least the reason that the proposed combination of Culnane and Jamieson renders the resulting device unsatisfactory for its intended purpose. *See* M.P.E.P. § 2143.01. In fact, the resulting device would not be capable of operation.

Jamieson describes an integrated circuit package 10 having a substrate 16. An exposed conductive layer 26 of substrate 16 extends across a center opening 27 in the dielectric layers of substrate 16. Integrated circuit 12 is mounted to conductive layer 26 from the top side of substrate 16, and a heat slug 30 is attached to conductive layer 26 from the bottom side of substrate 16. (*See* Jamieson, FIGs. 1-4; col. 2, lines 9-43).

The Office Action on pages 7 and 8 suggests that routing would not be precluded in the module of Culnane if it were modified to include heat spreader 30 of Jamieson, because "vias may be formed in the substrate to electrically connect the integrated circuit to the solder balls."

However, the module described in Culnane includes flip chip 252. Thus, in the combination of Culnane and Jamieson, exposed conductive layer 26 would be directly attached to the active surface of flip chip 252. Thus, routing between copper pads 254 and 260 of Culnane would be precluded, preventing signals at pads 254 from being provided to substrate 280, for example. Furthermore, in substrate 16 of Jamieson, vias cannot be present under an integrated circuit chip or die, in contrast to the assertion in the Office Action.

Thus, the proposed combination of Culnane and Jamieson would render the resulting device unsatisfactory for its intended purpose, and in fact, the device would be inoperative. Therefore, for at least the reasons set forth above, reconsideration and withdrawal of the rejection of claim 13 is respectfully requested.

Claims 16, 17, 52-59, and 70 also distinguish over Culnane and Jamieson for reasons similar to those set forth above with respect to independent claim 13, and further in view of their own features. Thus, Applicants respectfully request that the rejection of claims 13, 16, 17, and 52-59 be reconsidered and withdrawn.

In paragraph 4 of the Office Action, claim 69 was rejected as being unpatentable over Culnane in view of Jamieson and U.S. Patent No. 5,903,052 to Chen *et al.* (hereinafter Chen). Applicants respectfully traverse this rejection.

Claim 69 also distinguishes over Culnane and Jamieson for reasons similar to those set forth above with respect to independent claim 13, and further in view of its own features. Furthermore, Applicants assert that Chen does not supply the missing teachings. Thus, Applicants assert that claim 69 is patentable over Culnane, Jamieson, and Chen, alone or in combination. Therefore, Applicants respectfully request that this rejection be reconsidered and withdrawn.

Other Matters

The Office Action indicates that claims 3, 4, 6, 7, 9, 10, 12, 13, 16, 17, 38-65, and 68-70 are pending in the application and that claims 3, 4, 6, 7, 9, 10, 12, 38-51, 60-65 and 68 are withdrawn from consideration.

However, Applicants understand that claims 3, 4, 6, 7, 9, 10, 12, 13, 16, 17, 18, 20-32, 35-65, and 67-70 are pending in the application, with claims 3, 4, 6, 7, 9, 10, 12, 18, 20-32, and 35-51, 60-65, 67, and 68 being the withdrawn claims.

Applicants therefore request that the Examiner confirm Applicants' understanding of the pending and withdrawn claims.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,

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